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The Effects of Segmenting Worksheets on Independent Seatwork with Elementary Students Delivered in a Remote Manner Using Parents as Interventionists

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THE EFFECTS OF SEGMENTING WORKSHEETS ON INDEPENDENT SEATWORK WITH ELEMENTARY STUDENTS DELIVERED IN A REMOTE MANNER USING PARENTS AS INTERVENTIONISTS

by

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ABSTRACT

Students have a limited amount of time each day to complete independent assignments. These assignments prioritize the learning opportunities provided to students. Learning opportunities or the chance to practice with feedback is highly effective, and additional repetition enhances the learning experience. By increasing student's time-on-task, they will be provided more learning opportunities. This study sought to determine if segmented work could increase the number of problems completed, digits correct per minute, and on-task behavior. An alternating treatment design across four participants allowed for the comparison of segmented worksheets and whole worksheets. Additionally, parents served as the interventionist in this remote format research study. Overall, this study results failed to support segmenting worksheets as a stand-alone intervention. However, there was a high rate of treatment integrity by the parents, suggesting that parents can implement interventions with high integrity when sufficient support is provided. Secondarily, parents and children reported significant levels of social validity.

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DEDICATION

I would like to thank all of the teachers who supported me throughout this educational journey. To all the wonderful people that have left an impression on me during their time on this earth. Know that I take with me the little lessons you taught me during your lifetime Arron Eitel, Marsha McCraw, Martha Neil, and Eddie Gene Douglas.

To my parents, Shelli and Archie, and siblings, Maggie and T.J., thank you for believing in me and for supporting this lifelong dream. To my husband, who had little idea what he was agreeing to, thank you for giving me the freedom and support to pursue this dream. We are officially one step closer. To my mother-in-law, Mrs. Betty, thank you for the countless ways you support the running of our home and always making sure I have a cold Dr. Pepper in the fridge.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ILLUSTRATIONS

LIST OF ABBREVIATIONS

MTSS	Multitier Systems of Support
DCPM	*Digits Correct Per Minute*
IRP	*Intervention Rating Profile*
CIRP	*Child's Intervention Rating Profile*

CHAPTER I - INTRODUCTION

Completing academic tasks is the primary responsibility of students in academic settings, and success in school depends on the completion of any assigned academic work. For those students who consistently fail to complete academic work, they are at a greater likelihood of school failure or leaving school early (Bradshaw et al., 2008). Poor academic performance or school failure can lead to higher probability of dropping out, more discipline problems in schools, more in-school and out-of-school suspensions, higher likelihood of involvement with the legal system, and fewer options related to career aspirations (Casillas et al., 2012; Chen & Kaplan, 2003; Christle et al., 2007). Successfully intervening with students who have work completion issues is of great concern to teachers and parents alike.

In 2015, Rosenshine examined how students make use of time in school and determined that, on average, second graders spend only one hour and thirty minutes per school day actively engaged in an academic activity, whereas fifth graders spend only one hour and fifty-five minutes per school day in an academic activity. On average, second graders spend 40% of their day on academic tasks. It was also determined that these same students spend 73% of their math time working on independent seatwork, whereas 5th graders spend 76% of their math time on independent seatwork. This finding suggests that being on-task during independent seatwork may help students maximize their allotted instructional time and increase the amount of work produced. Subsequently, increasing academic production may lead to skill mastery (Albers & Greer, 1991).

COVID-19 presented many challenges to traditional learning. Schools have had to transition from traditional classroom face-to-face instruction to virtual platforms (Viner et

al., 2020). The pandemic changed the way students participate in the learning process. Some schools are exclusively online, while others have settled for a hybrid model with a portion of students learning from home every day. Many parents have opted to homeschool students who would typically attend a public or private school. The fall 2020 semester has looked very different (CDC, 2020) from previous semesters. With major changes to the structure of the classroom, interventions must adapt to support teachers, parents, and students in pursuit of education in this new academic world.

Daly et al., (1997) stated that there are five main reasons why students do not perform academically. These include not enough practice, insufficient motivation, lack of support or assistance, difficulty of tasks, or being required to perform the skill in a new way. Essentially, students must find intrinsic, utility value and attainment to be motivated to engage in academic tasks (Eccles & Wigfield, 1995). Some students are highly motivated by academic goals because these concepts come naturally to them, other students may need some support finding the right motivation to engage in academic achievement behaviors (Richotte et al., 2014). C. H. Skinner (1998) defined the *opportunity to learn* "as every time a stimulus was followed by a response" (p.65). Research has effectively provided evidence that when students receive more learning opportunities, there is an increase in accuracy and maintenance of the skill (Albers & Greer, 1991). Having more learning opportunities available to students allows them to generalize concepts to a number of different stimuli. As noted by Skinner (1998), a skill is not mastered until the skill can be completed with any stimulus or in a multitude of settings.

Multi-Tiered Systems of Support Framework

Multi-tiered systems of support (MTSS) consist of two main systems, Response to Intervention (RTI) and Positive Behavioral Intervention and Supports (PBIS; Sugai & Horner, 2009). It is within this larger system that academic and behavior concerns are systematically addressed. MTSS consist of tiers of support where a student's progress is monitored at each tier and subsequently, increasingly intensive supports are made available to the student as needed. RTI focuses on the development of academic skills and identifying students who need additional support early, while PBIS focuses on modifying the school environment to foster appropriate social and emotional behaviors and provides behavioral supports to individual students as needed. There are currently a limited number of evidence based, universal, and cost effective strategies used to promote positive behavior supports and increase academic engagement such as Effective Instruction Delivery (Matheson, & Shriver, 2005), the Good Behavior Game (Rubow et al., 2018), and Behavior Specific Praise (O'Handley et al., 2020).

In Tier I, all students receive instruction via an evidence-based academic and social curriculum under both systems. An MTSS teams monitor students using behavior screeners and benchmark academic testing. If additional academic or behavior supports are necessary, the student moves to Tier II where intervention efforts are delivered by classroom instructional personnel and are small group in nature. If the student fails to respond to these efforts by failing to show progress, the student moves to Tier III, where more individualized interventions are implemented, typically by specialized personnel such as an intervention specialist, school social worker, or school psychologist. Progress

monitoring continues in Tier III to assess student academic or behavioral gains (Center on Multi-Tiered System of Supports, 2020; Radley & Dart, 2019).

While MTSS can be very effective if implemented with integrity, it is important to note that there remains a paucity of evidence-based interventions at all levels for both academics and behavior, but especially at Tier II (O'Handley et al., 2020; Stormont, 2012). By designing and evaluating interventions that prove to be robust, cost effective, and easy-to-implement, we are providing our teachers, parents, and other school personnel with additional tools designed to address the needs of our students. The purpose of this project is to meet this objective.

Increasing Independent Work

As previously discussed, the importance of independent seatwork was alluded to in the Rosenshine study (2015) given the amount of time that students are engaged with such work. Other researchers have attempted various strategies designed to increase student production. Hart et al. (2010) assessed the impact of independent work, small group, and whole class instruction to determine when students with ADHD are most on task and when they produced the most work. They found that students with ADHD were more on task during small group instruction, however these effects did not carry over to the testing condition. As Hart et al., (2010) did not find any effect for independent seatwork, small group, or whole class instruction during the test conditions. In fact, their findings showed a decrease in work productivity in the small group test condition. Subsequently these children appeared to be on task more during the instructional period, but ultimately, they did not produce as many correct answers in the small group testing condition compared to independent and whole group.

Todd et al., (1999) reviewed and built upon the literature that suggests self-management skills, which can include; self-monitoring, self-evaluation, self-recruitment, self-delivery of reinforcement or a combination, are highly associated with reduction in problem behavior and improved academic performance. Specifically, the authors implemented a self-management package (self-monitoring, self-evaluation, and self-recruitment of a reinforcer) which was implemented with one student in two different class settings. The effects of the intervention were an increase in teacher praise, an increase in on-task behavior, an increase in work completion, and decreases in problem behaviors. The effectiveness of self-monitoring has been evidenced with children as young as the 1st grade (Levendoski & Cartledge, 2000; Rock, 2005; Vanleuvan & Wang, 1997). The effects of implementation of contingent reinforcement and noncontingent reinforcement were implemented with three participants. The authors found that contingent reinforcement alone had a larger effect on digits correct per session than the condition combining contingent and non-contingent reinforcement, however they did not assess for non-contingent reinforcement alone (Panahon & Martens, 2012).

Combining self-monitoring and video modeling, *On Task in a Box* ® (2014) has been used in school settings to increase on task behavior. King et al., (2017) found *On Task in a Box*® (2014) to be effective in increasing academic productivity, work accuracy, and time on task. While this intervention has promise, other studies have implemented the interspersal of easier math problems throughout the assignment to increase percent on-task (McCurdy et al., 2001) and total digits correct (Montarello & Martens, 2005). McCurdy explained that interspersal of easier problems can create reinforcement throughout the assignment. A similar concept, behavioral momentum,

allows the student to reach reinforcement faster creating the need to complete the next task to receive reinforcement. Just like in Newton's Law "an object in motion will stay in motion unless acted upon by another force" (Newton's Laws of Motion, 2021), so if the student begins even completing the smallest task the reinforcement can maintain the child's desire to complete additional tasks (Cooper et al., 2007; Fisher et al., 2021).

Outside of the traditional classroom setting independent work is required in the form of homework. Too many people assume homework is a menial task that must be completed but for students this skill is crucial. Completing homework is the skill building task which is essential for teaching students to complete tasks independently and in a timely manner as adults. These practice opportunities called homework are actually very meaningful and not just for the academic skills being practiced (Sheridan, 2009). Although other studies have investigated ways to increase homework productivity, the unique in-home virtual format of the current study allows for behavioral observations during an independent work time at home. This also allows for this intervention to be implemented and an effective assessment of if this intervention can be beneficial with homework tasks.

Wallace et al., (2003) examined the effects of breaking a larger assignment into smaller parts, coupled with the use of praise, on math problems completed and accuracy by a student. The teacher was instructed to divide a larger math assignment of 30 math problems into six parts, each having five problems and provide the student behavior-specific praise and a high-five for each of the smaller assignments completed until the student completed all subsets of the academic tasks.

Data were collected on the number of problems completed, the accuracy of problems completed, teacher interactions, teacher approvals, and teacher disapprovals. When implemented, the completion of math problems increased from a mean of six completed problems during a 20-minute period to a mean of 19.25 problems completed. The mean problems correct increased from 5.75 during baseline to 18.75 during the intervention. Upon return to baseline, the mean completed problems decreased to 11.66 but increased to 20.66 during the return to intervention. During the return to baseline the mean problems correct decreased to 10.33, but during the return to treatment the mean problems correct increased to 17.00. Teacher interactions and approvals increased in both intervention phases and decreased upon return to baseline. Overall, there was a decrease in teacher disapprovals during intervention implementation phases, with two days resulting in zero teacher disapprovals (Wallace et al., 2003).

The Wallace et al., (2003) study, while meaningful to the field, did have limitations. For example, with one participant there are not enough replications of the effect to be considered evidenced for practice Kratochwill et al., (2012). This study is an excellent starting point by assessing problems completed, problems correct and some anecdotal classroom behavior data. Within this study it is impossible to parse out if the segmenting, the reinforcement schedule of praise and high fives, or the potent combination caused the effect.

The current study addresses these limitations by increasing the number of participants and isolating the segmenting or breaking the larger academic task into smaller parts to determine the effectiveness of such a strategy. Additionally, the intervention occurred in the home setting with the parent as the intervention

administrator. Stakeholders often assume that breaking a task into smaller parts will result in increasing the work production of a student or child (Lane et al., 2007). As well, the assumption of most is that such a strategy designed to increase work production has an empirical basis, but the information presented here suggests otherwise.

Purpose

As noted in the review of Wallace et al., (2003), this is the only study that has investigated the effect of using multiple shorter assignments, rather than a single long assignment, on academic production. While one condition of their study did address the question, it was conducted with a single student who had an intellectual disability. Wallace et al. (2003), although adding to the literature base of simple robust academic interventions, also incorporated praise as a component in the intervention, thus making it difficult to conclude which aspect of the package, praise or breaking the longer assignment into smaller parts, was responsible for the intervention effects. The current study addressed the limitations and used the parents as interventionists. This simple-to-implement parent driven intervention could have proven to be an effective way to increase students' independent work during limited academic time in the home setting. Additionally, this investigation contributes to the Tier II and III literature bases of simple robust interventions for use in the home and classroom setting. It was hypothesized that segmented worksheets would show an increase in problems completed. The following research questions were addressed:

1. When segmented worksheets are delivered by parents via a remote platform, does the number of math problems completed increase in comparison to presenting the worksheet as a longer single task?

2. When segmented worksheets are delivered by parents via a remote platform, does the number of digits correct per minute increase in comparison to presentation of the worksheet as a longer single task?
3. When segmented worksheets are delivered by parents via a remote platform, does the rate of on-task behavior increase in comparison to presentation of the worksheet as a longer single task.
4. When segmented worksheets are delivered by parents via a remote platform, does the level of off-task behavior decrease in comparison to the presentation of the worksheet as a longer single task.

CHAPTER II – METHODS

Participants and Setting

Study participants included four parent-child dyads with the child currently being enrolled in 2nd-3rd grades. Participants were recruited though a multitude of social media platforms and through solicitation efforts in school districts and libraries. After a participant's parent completed a short contact form, the researcher scheduled a parent interview. During this interview, parents were informed of the intervention and how sessions would occur. Consent and Assent forms (see Appendix B and C) and demographic information were also collected during this session. During the initial interviews, all participants were reported by their parents to be compliant children. All four participants' interventions were led by their mothers whose ages ranged from 28-34. All participants parents agreed to lead the intervention and confirmed they had at least one Zoom capable device and a device to support the transmission of completed worksheets.

Three participants received primary educational instruction in-person at their local school, and one participant attended a homeschool group using a virtual format. Due to the virtual nature of this study, participants were recruited from all over the United States. Participants included a Caucasian, eight-year-old female in the 2nd grade (Brittany), a Caucasian, nine-year-old female in the third grade (Everly), a Caucasian eight-year-old male in 2nd grade (Pierce) and an African American, eight-year-old male in 3rd grade (Kayden). Participants names were changed to protect their identity. No participants had a diagnosis or disability ruling of Intellectual Disability, Specific Learning Disability, or Autism Spectrum Disorder. This criterion was selected to exclude students who

potentially had negative learning histories, which may have included frequent failure or multiple other academic interventions. The reasoning was twofold in that those students would be best served with a more intensive intervention, and this study focused on universal strategies to support teachers, parents and students. Additionally, if the child was reported to be non-compliant with adult directives as indicated by the parents during the parent interview a different intervention might better have supported their needs.

Since the setting of this study was a virtual format, to be included in this study, the family was required to have a home computer or tablet, which served as an observation tool and a tool for transmission of data back to the student researcher

Instruments and Materials

Brief outline of information/activities to be covered during the initial parent meeting (Appendix D). To ensure that all aspects of the study were covered with all participating parents during the initial meeting, a brief outline of the topics covered are included in Appendix D. This outline served as the script for the primary researcher during each meeting with participating parents. General topics/activities covered during the meeting included obtaining parent permission for study participation, providing a brief explanation of the study with details, providing information as to how observations will be conducted, providing information regarding positioning of the electronic devices for observation and recording purposes, gathering information related to the best time to conduct the sessions, and information related to materials given to the parent for the study activities.

*Math Computation Curriculum-Based Measurement Probes***.** To determine approximate instructional levels in math, classic AIMSweb Math Computations probes were

administered. Students were provided current grade level probes and data driven decision making used with the support of AIMSweb norms to determine any increase or decrease level as needed (PsycCorp/Pearson, 2004). This procedure allowed the primary researcher to determine the instructional level at which each student was functioning and to select appropriate instructional level work sheets that were used during this part of the study. Further detail about how the instructional level was obtained can be found in the procedures section of this document.

Integrity Checklists and Scripts. A treatment integrity form for intervention phase A (Appendix G) and intervention phase B (Appendix I) along with a list of intervention steps for each phase that was provided to the parents can be found in the appendix of this document (Appendix F, H).

Worksheets and Segmented Worksheets. Each whole worksheet consisted of 100 problems on green 8.5 by 11 inch paper and was labeled with a B in the header of every worksheet. Each segmented worksheet consisted of five equal segments of 20 problems each on one third of a yellow piece of paper labeled with a letter A in the footer of every worksheet. Both segment worksheets and whole worksheets were instructionally equivalent. Worksheets were designed by the researcher using the skill sequence derived from Burns, VanderHeyden and Jiban (2006). A minimum of one thousand five hundred problems were collected for each grade level to ensure each worksheet had zero repeating problems across conditions or any of the 15 worksheets. The number of problems per skill were divided by fifteen so that the same percentage of each skill was included in every worksheet. Then numbers were randomly generated to determine the problems for

each worksheet. For the verification worksheets, one set of problems was used to create a segmented and whole worksheet.

Intervention Rating Profile-15 (IRP-15). The IRP-15 (Appendix J) was administered to assess the levels of acceptability of the intervention (Martens et al., 1985). The IRP-15 consists of 15 items, each scored on a six-point Likert Scale. This allowed the rater to rate each statement from strongly disagree (1) to strongly agree (6). High scores indicate treatment acceptability. The IRP-15 has a Cronbach Alpha of .98; anything over .70 is considered to have internal consistency (Martens et al., 1985). Modifications were made to address academic production instead of simply a challenging behavior. For example, the original item was worded "this would be an acceptable intervention for the child's problem behavior" and was modified to "This would be an acceptable intervention for the child's academic production." All modifications have the probability of changing the psychometric properties and therefore should be documented (Silvia, 2019). Overall, the IRP-15 was used in this case as a gross indicator of relative preference.

Children's Intervention Rating Profile (CIRP). This measure is a modification of the original Intervention Rating Profile (Appendix K). It consists of 7 Likert scale items and assesses the treatment acceptably and relative preference from the child's perspective. The CIRP has a coefficient alpha of .89 (Elliot, 1986). The CIRP has adequate levels of internal consistency and has effectively shown discrimination between interventions (Waas & Anderson, 1991). In this study, the CIRP was provided to the parent via a Qualtrics link at the end of the last verification session. Parents were to assist students with completion of this task as the CIRP is written at a 5th grade reading level.

Zoom. Zoom (Yuan, E. 2011), a video communication platform, was utilized for all observations, training sessions, interviews, and assessment procedures for this study. Zoom is HIPAA Compliant (Yuan, E. 2011). All sessions were recorded and kept for two weeks based on university policy. Zoom has many beneficial features including screening sharing, the chat function, and the ability to mute and turn off cameras. The use of Zoom did not require the participant to download any additional software, making it easily accessible from a multitude of device types.

Dependent Measures and Data Collection

The primary dependent variable for this study was the number of problems completed. A problem was counted as completed if the student had written a numerical answer on the answer line. Non-examples included a blank answer line, a letter, or an unidentifiable squiggle. A problem was counted as answered correctly if the student marked an accurate solution to the math problem. Secondary dependent variables included digits correct per minute (DCPM), on-task, and off-task behaviors. DCPM is a variable that accounts for fluency, which is the combination of accuracy and speed. Fluency is significantly more reliable than accuracy alone (Burns, VanDerHeyden, & Jiban, 2006). DCPM were counted for every single correct digit in the correct place, for each session and divided by 10, since each session was ten minutes of work total. Problems completed and DCPM were counted and documented at the bottom of the whole worksheet or on the each of the five segmented worksheets with an overall total, at the end of the 10 minutes by the researcher. Observations were conducted by graduate students and the primary researcher. Observers were prompted to record data upon

hearing the audio prompting. In order to minimize reactivity, all observers muted themselves and turned off the camera for the duration of the observation.

On and off-task behaviors were collected using a 10-second momentary time sampling procedure during a 10-minute observation. On-task behavior was defined as sitting in their chair, eyes on their materials, and pencil in their hand. Non-examples included fidgeting with other items, walking around the room, and taking a nap. Off-task behavior was defined as engaging in behavior outside of the task requirements. Examples include talking, laying head on the table, orienting away from materials. Non-examples included eyes on the paper, pencil in hand, or sitting in his or her chair.

Interobserver Agreement, Treatment Integrity, and Procedural Integrity

Treatment integrity data were collected and monitored through the permanent product of treatment integrity forms and date-stamped copies of the student's work, which were a byproduct of every intervention session. Integrity checks were conducted for every session via Zoom (Appendix G or I). Therefore, 100% of intervention sessions were reviewed for treatment integrity, and 40% of each condition was assessed for interobserver agreement. Additionally, IOA was assessed for 40% of each condition for problems correct, DCPM treatment integrity, on-task and off-task behavior. IOA was completed by a second doctoral school psychology student who was trained on this intervention and its components. IOA sessions were chosen prior to participants beginning the project and were based on a random number generator. IOA was calculated by dividing the number of agreements by the total number of agreements and disagreements and multiplying by 100. IOA averaged 97% (92-100). IOA was assessed for 40% of all worksheets for each condition and averaged 98% (94-100). Treatment

integrity was collected for every session and averaged 98% (85-100). IOA of treatment integrity was assessed for 40% of sessions, per condition, and averaged 100%.

Experimental Design

This study utilized an alternating treatments design according to standards set forth by Kratochwill et al., (2012). This study provides data, has an independent variable, intersession agreement, does not have residual effects and demonstrates any effect over time and data per phase as set forth by the What Works Clearinghouse requirements (Standard Handbook 4.1., 2020). The present study implemented two interventions with five data points each and then a verification phase which consisted of five additional data points. The interventions consisted of (A) segmented worksheets, and (B) whole worksheets. Five repetitions of the alternating sequences are required to meet the standards as put forth by Kratochwill et al., (2012). Additionally, a verification phase consisted of five additional data points to replicate any findings. In this design, there was no baseline but phase B, or whole worksheets, is comparable to worksheets typically provided in an academic setting, and served as a form of treatment as usual. This design minimized order effects and multiple treatment interference, maintaining stronger internal validity. The alternating treatment conditions were chosen using a random number generator prior to any participants being selected. The same condition did not repeat more than twice. Twice, when the number repeated the researcher generated another number to minimize treatment effects.

Data Analysis

Data were analyzed using trend, level, variability, consistency of effect, immediacy of effect, and non-overlap of data points (Kratochwill et al., 2012). Data were

analyzed individually for each participant to determine if there was a divergence in the number of problems completed, DCPM, on-task behaviors and off-task behaviors in each phase. The primary dependent variable used to determine which intervention should be verified was number of problems completed.

Procedure

Introductory Parent Session

After students were recommended for the present study, the primary researcher met with a parent or guardian via Zoom. The primary researcher presented the consent form and explained study procedures and expectations in detail. This also provided time for the researcher to inquire about the child's strengths and weaknesses regarding mathematical skills and completing independent work at home. The researcher ensured that all inclusion and exclusion criteria were satisfied. Upon receiving the signed consent and assent forms, the curriculum-based measurement session was scheduled for one week from that date to ensure the United States Postal Service would have the materials delivered to their home prior to the session.

Curriculum-Based Measurement Session

The researcher mailed the parent or guardian a ½ inch binder that included two probes at each grade level that may have been needed for the performance assessment. Along with this binder, the researcher sent a package of pencils. Two days prior to the scheduled session, the researcher contacted the parents to ensure their package arrived and confirmed the CBM session. Upon confirmation, the researcher sent a Zoom link for the CBM session. Each link required a password, and a waiting room was set up to ensure confidentiality. The student was given curriculum-based measures by the parent at the

instruction of the researcher. The researcher administered the instructions, time keeping, and scoring of the curriculum-based measurements via Zoom, using standardized procedures. The student had 8-minutes to work on the probe. At the eight-minute mark, the student stopped, and the parent captured a picture of the worksheet and sent the image via email to the researcher. The researcher then scored the probe and notified the parent of the next probe to administer to the student. This continued until the student's instructional level right before frustrational was determined. The computation fluency norms provided by AIMSweb were used to assess the level between, mastery (75^{th}-100^{th} percentile), instructional (25^{th} -74^{th} percentile) or frustrational (1^{st}-24^{th} percentile) (PsycCorp/Pearson, 2004).

Designing and Sending Intervention Materials

After the Curriculum-Based Measurement session, the primary investigator created whole worksheets and segmented worksheets for the child to use during independent work covering math computation facts designed based on their instructional level. For each grade level, 1,500 problems were collected and randomly assigned to each worksheet to prevent overlap effects and ensure the same percentage of each skill was present on every worksheet. The researcher sent a second binder with five labeled whole worksheets and five labeled segmented worksheets, all at an equivalent instructional level. The binder was clearly labeled and organized for easy parent administration. The binder also had five verification whole worksheets and segmented worksheets. Both of these forms had the exact same problems. Two types of worksheets were sent to ensure they had all worksheets prior to the start of intervention.

Parent Training

After the parent received their package of intervention materials, the primary researcher met with the parent and reviewed the procedures for both intervention phases. The researcher informed the parent of observations standards, such as where the computer should and should not be placed. The primary investigator notified the parent that the observer would have their camera off and be muted to reduce reactivity. The researcher worked with parents to troubleshoot any potential technical issues during this session. Sessions were held in the same location each time to prevent technical issues and to ensure the observer could complete the integrity check. The parent was trained to give the student the whole worksheet or segmented worksheets on the instructional level given by the observer, read the script for each condition, and set a timer accordingly. For the segmented worksheet condition, the timer was set for two minutes, and the segmented worksheet was changed at every two-minute interval until 10 minutes had lapsed. The parent was asked to take a picture or make a copy of the worksheet at the 10-minute mark. These data were digitally sent to the researcher for analysis. The researcher reviewed the treatment integrity forms the observer completed during each observation. During this session, the dates and times of sessions were determined, and a repeating Zoom link was sent. Reminder emails were sent to parents the day of the session in order to promote attendance. Depending on the availability of the student and parent, each participant had two to three sessions scheduled a week.

Intervention

In order to account for any potential technological issues, all observers began the Zoom session two minutes prior to the start of the intervention. This time allowed the

parent to set up the device as previously trained upon and dim the screen, so the student is less aware of the observer's presence. The observer muted and turned off their camera to reduce reactivity. If the student was not visible on the screen, the parent was called for trouble shooting.

For the purposes of this study, a segmented worksheet was one-fifth of the original worksheet or 100 problems. Segmenting in this manner was designed to create behavioral momentum upon completion of each segmented sheet (Cooper et al., 2007). In phase A, the parent read the script to the student, gave the child the first segmented worksheet and set the timer for two minutes. When the timer went off, the parent gave the student the second segmented worksheet and set the timer for another two minutes. This procedure was repeated until the child had worked for a total of ten minutes, two minutes per each one of the five segment worksheets. When the 10 minutes ended, the parent gathered the five segmented work samples, captured a picture of the completed work, and digitally sent it to the researcher or scanned and forwarded them to the primary researcher. If the parent failed to complete a step or implemented a step incorrectly, the principal researcher provided corrective feedback to the parent.

For phase B, the parent read the script for the whole worksheets. Upon giving the student the worksheet, the parent set a timer for 10 minutes. The observer kept the time for the integrity check documentation. When 10 minutes ended, the parent took a picture of the whole worksheet and sent it to the observer. This allowed for a permanent product to be saved from each session. In both phases, the observer documented on the integrity form how many problems were answered and the student's total digits correct per minute.

CHAPTER III - RESULTS

Completed Problems on Segmented and Whole Worksheets

Instructional levels were determined for all four participants to ensure the most appropriate worksheets were created for their needs. AIMSweb Math Computation probes were administered starting with their current grade level and continuing until they were instructional or in 25th-75th percentile according to AIMSweb national norms. It is important to note that Common Core Standards refer to what should be instructed and AIMSweb and other curriculum-based measurements address benchmarking and progress monitoring. AIMSweb reports they are complementary to Common Core Standards, but it is important to note that Common Core Standards were not developed until 2010. Additional version of AIMSweb such as AIMSweb plus may coordinate better those probes designed prior to their release (Shinn, 2012). All segmented and whole worksheets were designed using the standards set forth by Burns, VanderHeyden and Jiban (2006), and these grade level standards align with Common Core Standards. Everly's worksheets were composed of 5th-grade level mathematical problems, Kayden's worksheets were composed of 4th-grade level mathematical problems and skills, Pierce's worksheets were composed of 3rd-grade level mathematical skills and problems, and Brittany's worksheets were composed of 2nd-grade level mathematical problems.

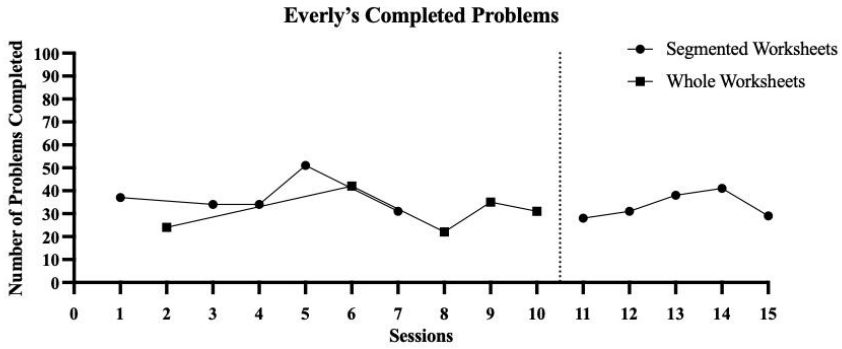
Table 1

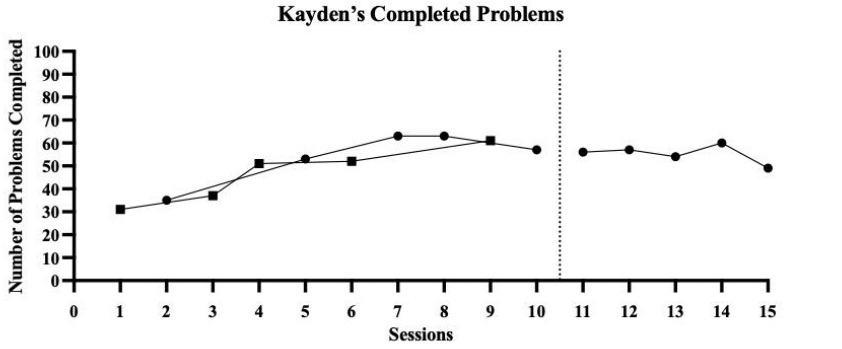
Participant information

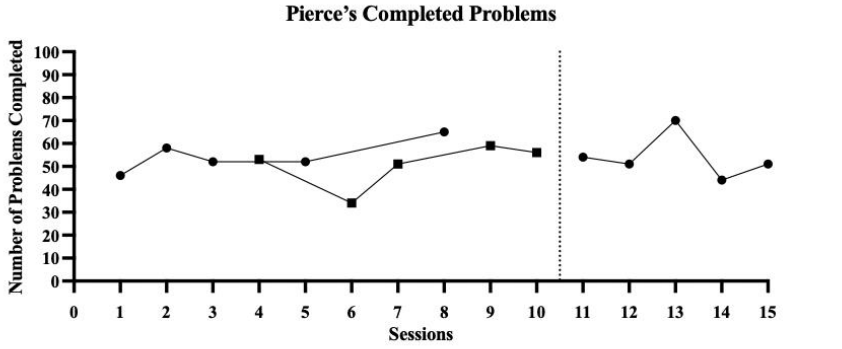
Participant	Grade	Instructional Level	Average Dose of intervention
Everly	3rd	5th	Weekly
Kayden	3rd	4th	Bi-Weekly
Pierce	2nd	3rd	3 times a week
Brittany	2nd	2nd	3-5 times a week

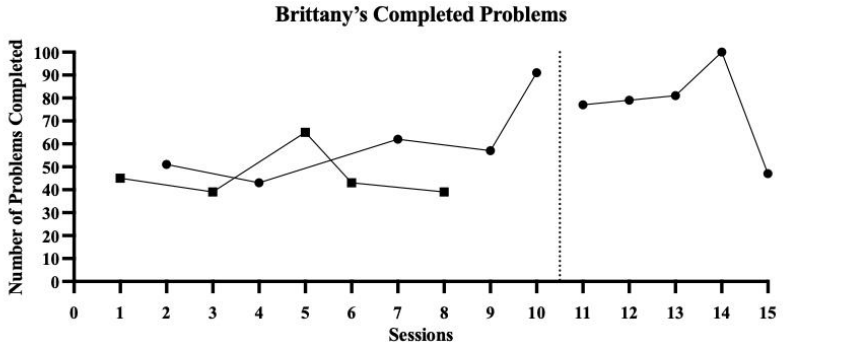
Verification

Verification phases were determined by the mean during both A and B phases. For all four participants, the mean was slightly higher in phase A. Therefore, phase A was verified. Additionally, based on the results found in Wallace et al., (2013) it was hypothesized that segmented worksheets would be effective in increasing problems completed. The alternating treatment design is a robust design, however a primary threat to internal validity is carry over effects from multiple treatment interference by verifying one condition this threat is minimized. Although visual analysis indicated overlap, little divergence, and variable data in general, all four participants did show an increased mean in the verification phase compared to phase B. During phase B, whole worksheets served as treatment as usual, and therefore the intervention of segmented worksheets was verified. Brittany's completed problems graphs provided evidence of an effect by having clear divergence, and level was maintained in the verification phase overall. However, since there was no replication of this effect among the other participants, the evidence for









Completed Problems

this intervention lacked sufficient support. Depicted in Figure 1, is the problems completed per session for all four participants.

As depicted in Figure 1, Everly's number of completed problems was maintained throughout both conditions and the verification phase. This is visible in both the graph and means, condition A (M=37.4, SD=7.89), condition B (M= 30.8, SD=8.16), and the verification of condition A (M=33.4, SD=5.77). Although there is some variability within each condition, there is no divergence from one condition to the other. Both conditions and the verification phase have a majority of overlapping data points. There was no evidence that segmented worksheets was more effective than whole worksheets.

For Kayden, the number of completed problems does show an increase in level but no clear divergence between conditions. Rather, the more he practiced similar problem types the more problems he was able to complete on both segmented and whole worksheets. Visually, there was no divergence. However, there is a slight difference in the mean for condition A (M=54.2, SD=11.54) and the mean for verification of condition A (M=55.2, SD=4.08) as compared to condition B's (M=46. 4, SD=4.08). The trend was consistent, but there is significant overlapping of data points between conditions.

For Pierce, the number of completed problems are similar across conditions, and there is no clear divergence. There is a slight but consistent difference in the means in condition A (M=54.2, SD=7.19) and verification of condition A (M=54, SD=9.66) as compared to condition B (M =46.2, SD=9.66). However, it is important to note the high standard deviations that speak to the overall level of variability.

In Brittany's case, there is clear divergence with few overlapping data points. The mean for condition A (M=60.8, SD=18.30) is higher than condition B (M=46.2,

SD=10.82) and higher still in the verification phase (M=76.2, SD=19.03). It is essential to note the high standard deviations; these are visually represented by the variability shown throughout the graph.

Digits Correct Per Minute

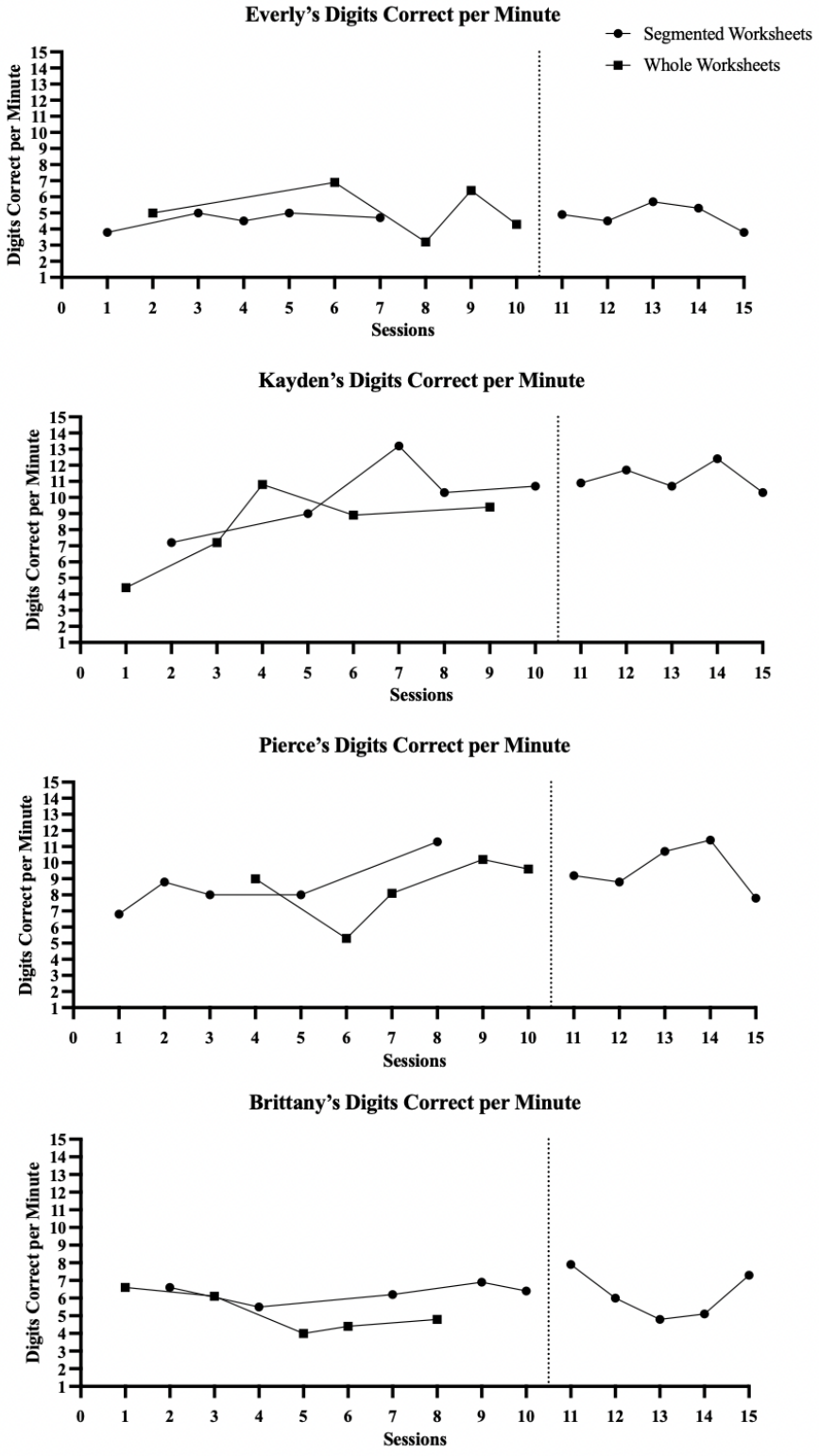
DCPM, depicted in Figure 2, were calculated by counting all of the digits correct per set of segmented worksheets or whole worksheet and dividing by 10 to account for accuracy and speed. These scores resulted in a range of 3.2-12.4 DCPM across all four participants. Visually, there is some significant overlap and little divergence, and in general, the whole worksheet condition created very variable data. Brittany and Kayden data showed divergence between condition A and B. Those levels were maintained during verification. Everly's data were extremely variable and represented significant overlap. Pierce's data had a majority of overlapping points.

For Everly, the variability in condition B negates what little divergence there might be. There are many overlapping data points, so even though the mean for condition B (M=5.16, SD=1.51) is slightly higher than condition A (M=4.4, SD=.49) and the verification of condition A (M=4.84, SD=.73), there was not enough of a difference to support an effect.

Kayden's DCPM data suggested a similar increase in level in condition A and verification compared to condition B as there was in his completed problems graph found in Figure 1. However, there are more nonoverlapping data points with a slightly higher level. This is also represented in the means of condition A (M=10.8, SD=2.21), the verification of A (M=11.2, SD=.84), and the lower mean of condition B (M=8.14, SD=2.45). There was a slight divergence after session 6.

Pierce's DCPM data were variable across all conditions. The overall level is similar across conditions as noted in the means for condition A (M=8.58, SD=1.67) condition B (M=8.44, SD=1.91) and verification (M=9.58, SD=1.45) as well as through visual analysis. There were too many overlapping data points to consider any divergence.

Brittany's DCPM data indicated an increase in the means of condition A (M=6.32, SD=.52) condition B (M=5.18, SD=1.11) and the verification of condition A (M=6.22, SD=1.35). There was a slight divergence but many overlapping data points. All conditions ended with an overall increasing trend. Condition B was variable, but condition A and the verification phase maintained a similar and stable level.



Digits Correct per Minute

On-task

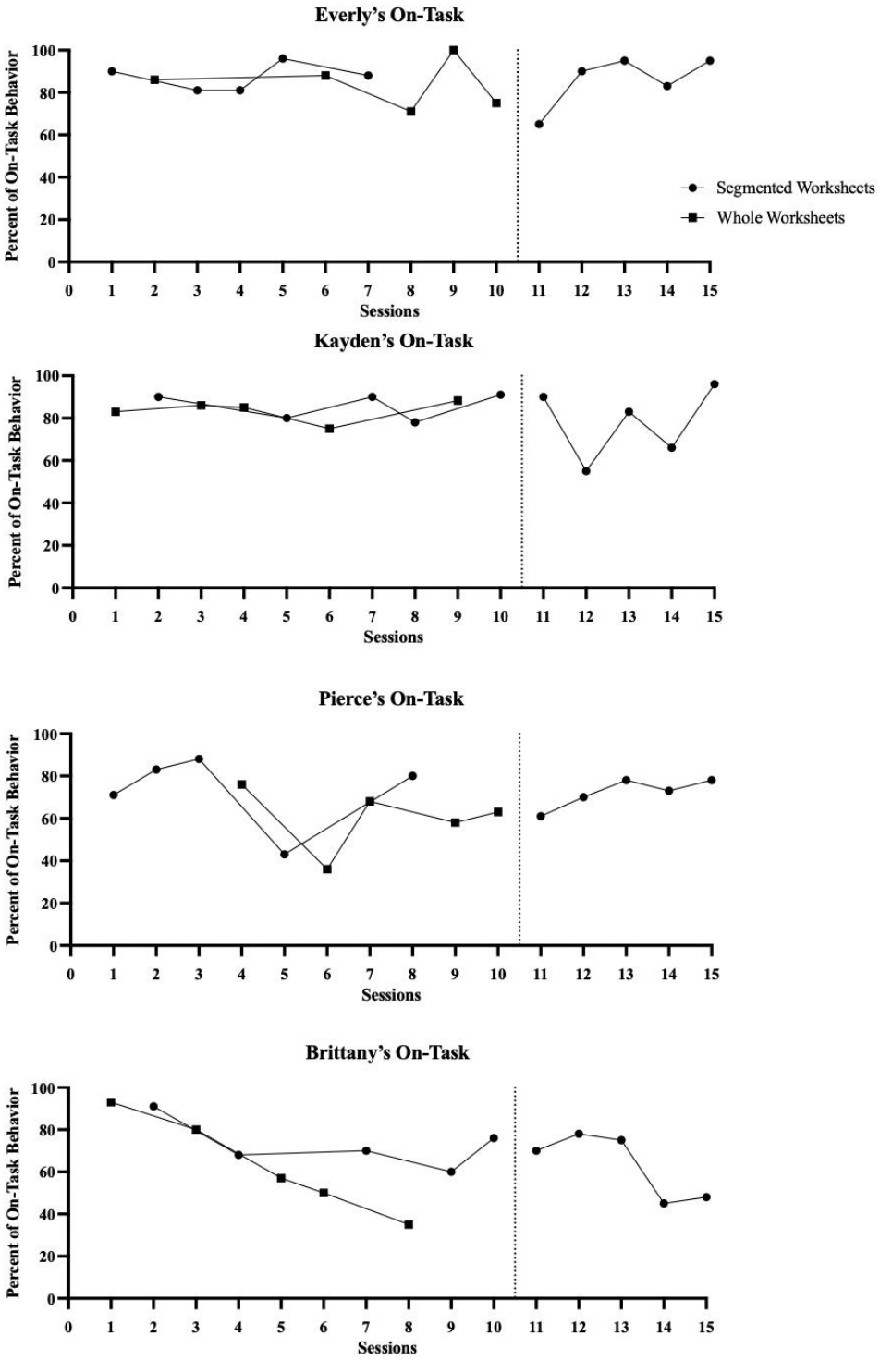
Everly's percentage of on-task behavior indicated across conditions highly variable performance with many overlapping data points. Condition A (M=86.8, SD=6.37), verification of A (M=85.6, SD=12.52) and condition B (M=84, 85.6) showed a slight mean increase for condition A, with little indication of an effect. There was an increasing trend across both conditions and no visually represented divergence.

Due to the variability seen in the verification phase of Kayden's graph, the mean for the verification phase (M=78, SD=17.07) was lower with a higher standard deviation compared to condition A (M=85.8, SD=6.26) and condition B (M=83.46, SD=5.10). The extreme variability in the verification phase could be a result of home renovations occurring throughout this phase. There was no meaningful divergence across conditions.

As shown in Figure 3, Pierce's on-task behavior started with an increasing trend and then a sharp decrease and a return to increasing trend for condition A. There was significant variability among both conditions but was less visible in the verification phase. The means were higher in condition A (M=73, SD=17.87) and the verification condition A (M=72, SD=7.03) compared to condition B (M=60.2, SD=15.07). The level in the verification phase was similar to that of the level of condition B. There was no significant divergence across any condition and many overlapping data points.

Brittany's percentage of on-task behaviors begins to be a clear divergence between condition A and condition B after the first four sessions. This divergence continued in the verification phase. Condition A and the verification phase had many overlapping data points with condition B. The means were similar, and the standard

On-



Task Behavior

deviation were large across all conditions; condition A (M=67.8, SD=63) condition B (M=63, SD=23.33), and the verification phase A (M=63.18, SD=15.56). The verification phase ended on an upward trend after a sharp decrease suggesting that the level might have stabilized given additional sessions.

Off-task

Off-task behavior, depicted in Figure 4, was assessed using a momentary time sampling observation of each session. Off-task behavior was defined as engaging in behavior outside of the task requirements. Examples included talking, laying head on the table, orienting away from materials. Non examples included eyes on paper, pencil in hand, or sitting in his or her chair. Overall, there was not enough clear divergence to say an effect was present with a minimum of three replications. However, Pierce's and Brittany's data indicated divergence with an increasing trend of off-task behavior for the whole worksheet condition, although both participant's graphs show some overlapping data points. Everly's and Kayden's performance did not indicate divergence; there were many overlapping data points; and their data were variable throughout.

Everly's off-task behavior was variable with many overlapping data points. Condition A (M=13.2, SD=7.62), showed an increase in condition B (M=15.4, SD=14.2) and a decrease during the verification phase of condition A (M=14.2, SD=12.47). With no true divergence and variable data, there was no evident intervention effect.

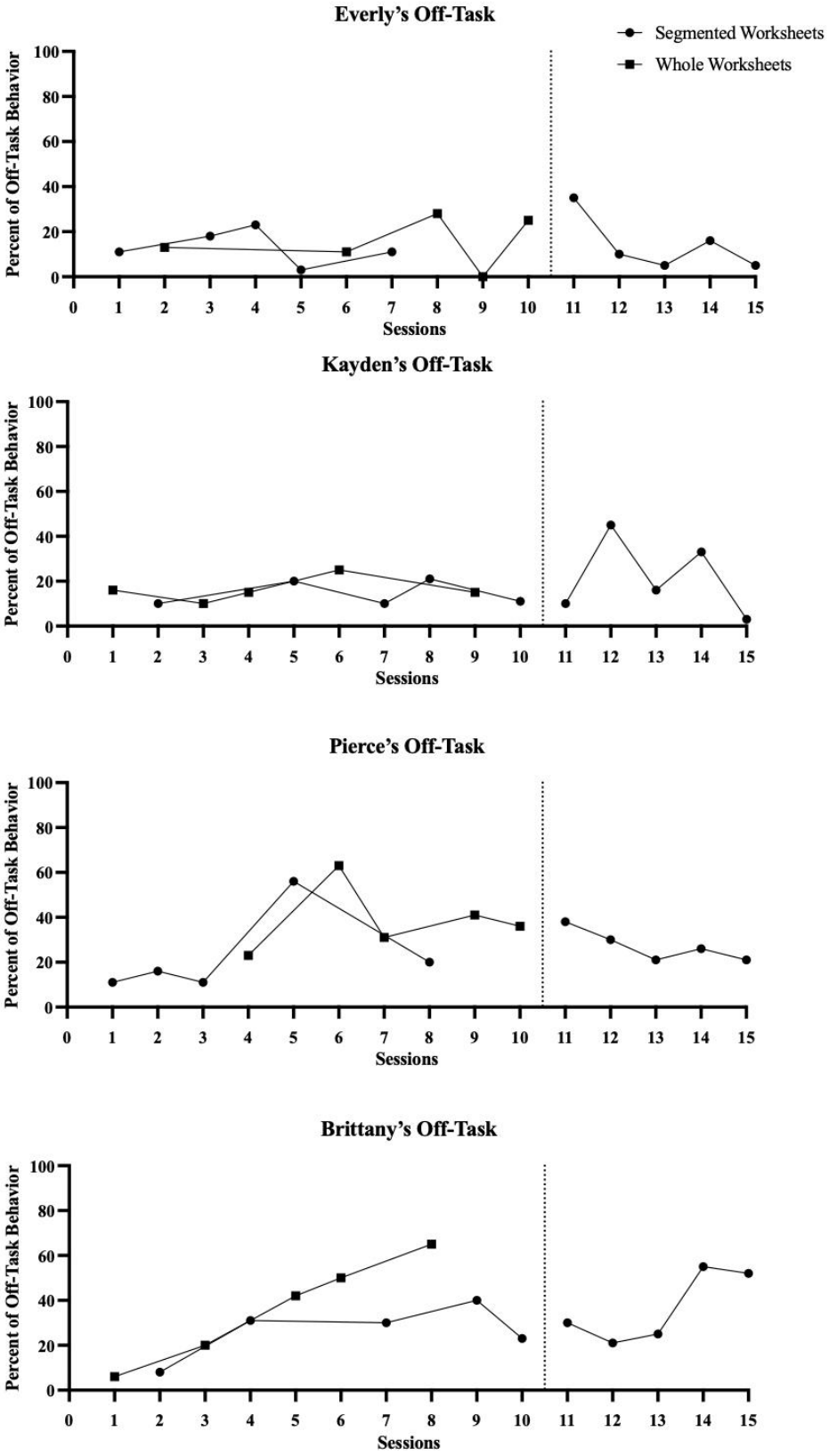


Figure 1. Off-Task Behavior

Kayden's percentage of off-task behavior suggested that condition A (M=14.4, SD=5.59) shows overlapping data points and no divergence from condition B (M=16.2, SD=17.24). The verification phase of condition A was extremely variable ranging from 3% to 45% (M=21.4, SD=17.24). Level and trend were similar across the A and B conditions.

There was high variability and overlapping data points suggesting no clear divergence, thus no intervention effect. Condition A (M=22.8, SD=18.93) showed less off-task behavior than condition B (M=38.8, SD=15.07), and the mean returns to a lower level in the verification phase (M=27.2, SD=7.12). Although the means were significantly different, the standard deviations were quite high. The verification phase ended in a decreasing trend but did not yet reach the level of the original A condition.

Brittany's off-task behavior data suggested divergence after the fourth data point, but the verification phase did end in an increasing trend. Condition A (M=27.06, SD=12.92), condition B (M=36.6, SD=23.59), and the verification phase resulted in similar mean (M=36.6, SD=15.78) but with a lower standard deviation. There were some overlapping data points.

Everly

Across all four dependent variables, Everly did not show an effect when given the segmented worksheet versus the standard whole worksheet. In fact, when looking at the overall level of DCPM per the whole sheet condition, it appears that Everly performed better under the whole worksheet condition. All other variables were inconclusive due to overlapping data and high variability.

Kayden

Kayden's completed problems showed no divergence, similar level and trend, and many overlapping data points. This similar level and trend continued in the verification phase as well. Kayden's DCPM data were indicative of a clear increased level for the segmented worksheet condition and verification, although some overlapping data points were evident. Her on-task and off-task data were marked by no divergence and by extensive variability, indicating no effect for her on-task behavior in either condition.

Pierce

Pierce's completed problems and DCPM indicated no clear difference between either condition. There was extensive overlap and the levels were equivalent. On-task and off-task behavior indicated less overlap but significant variability in each condition.

Brittany

Brittany's completed problems data indicated some divergence and variability for the whole worksheet condition. The verification phase indicated a stable upward trend that was marked by a sharp decrease in the very last session. While there was some overlap and variability in Brittany's DCPM, there was a consistent level of performance across the segmented worksheets condition. Although variable, the verification phase did end on an upward trend. For her on-task behavior, clear divergence begins to show for condition A after the first four data points and was maintained throughout verification. Although there was some variability in verification, it ended on an upward trend. Her off-task data suggested a similar level for seven of the ten segmented worksheets condition and verification phase. However, some overlap occurred in the first few sessions, and a

sharp trend upward during the last two verification sessions, indicating some level of variability.

Social Validity

The modified IRP-15 (Martens et al.,1985), was administered after the last intervention session. A Qualtrics link was sent via email with instructions to complete the survey and a reminder that all answers would remain anonymous. Three of four parents participated in the completion of the IRP-15. The six-point Likert Scale allowed the rater to rate each statement from strongly disagree (1) to strongly agree (6). Averages of these answers ranged from 3.67 to 5.67. The lowest scored item was, "The child's academic production is severe enough to warrant use of this intervention." This could simply be explained by the fact that the children who were included in this study were not required to have a problem with academic production to take part in this study. All other items were endorsed as agreed or strongly agreed. Some examples of items included are; "Overall, this intervention would be beneficial for the child.", "Most parents would find this intervention suitable for academic production.", "This intervention should prove effective in changing in the child's academic production.", and "This intervention is reasonable for the academic production behavior described." The overall (M=5.27, SD=.52) results of the IRP-15 suggested that participants found this intervention acceptable.

The CIRP (Elliot, 1986), was administered simultaneously via Qualtrics link with instructions to support the student as needed in completion of this short survey about the intervention. The seven Likert scale items allowed the student to choose between one or "I agree." to six or "I do not agree." Only two participants completed this social validity

measure; therefore, results should be interpreted with caution. Both participants agreed that “The program was fair.”, “This program could help other kids, too.”, and “I liked the program we used.” This is of interest considering that anecdotally, they did not like “the yellow sheets” or the segmented condition. Both participants did not agree with the statement, “This program caused problems with my friends.” The item “My parent was too harsh on me.” averaged a 5.00, meaning that the majority did not agree. The item “Being in this program helped me to do better in school.” averaged a 2.00, meaning that most agreed. Half agreed, and the other half did not agree with the item “There were better ways to teach me.” The overall results of the CIRP (M=2.9, SD=2.2) suggested that the students found this intervention to be acceptable.

CHAPTER IV – DISCUSSION

The purpose of this research study was to assess if there was an effect on completed problems, DCPM, on-task behavior, and off-task behavior when a student was presented with segmented worksheets compared to the same type of math problems on one longer form. Secondarily, parents' and participants' preference and intervention acceptability were assessed.

Despite the insufficient replications to consider this intervention evidence-based at this time, there was for one participant an intervention effect for all dependent variables. Of note, the participants that showed a slight effect were the participants completing work on the second and third-grade level. This could be due to a multitude of reasons such as the problem or skill type, or the time it takes to complete each problem. The other two participants showed little divergence with significant overlap for completed problems, DCPM, and on-task behavior. They also showed significant overlap in percentage of off-task behavior. Due to the differing results, there was insufficient evidence to support that segment worksheets increased completed problems, DCPM, or on-task behavior. Secondarily there was insufficient evidence to support a decrease of off-task behavior among all four participants.

The results found in this study differed greatly from that of the Wallace et al. (2003) study. The original study only had one participant and was effective in increasing his problems completed. However, they paired the completion of each segmented worksheet with behavior-specific praise and a high five. This study's goal was to see if the segmenting of worksheets alone would provide enough reinforcement to create behavioral momentum and increase the completion of the math problems. Based on the

results of this study, it is clear that segmenting alone did not result in increased academic output for the majority of students. Additionally, the original study took place in an inclusion classroom which is a different environment compared to a child in the home setting. The home can be a very reinforcing place for most children. With all of their favorite toys and comfort items, and attention provided by parents and siblings, the virtual environment can offer many uncontrollable variables.

Based on the IRP-15 and CIRP results parents and participants felt that this intervention could be helpful in increasing academic production. Anecdotally, most children verbally reported they did not like the "yellow" or segmented worksheets. This could be explained by the short time period students had to complete each segmented worksheet. Some students anecdotally reported that there were more problems on the segmented worksheets than the whole worksheet. Secondarily, students had twice the exposure to yellow or segmented sheets compared to the whole worksheet. Additionally, half of the students who completed the CIRP agreed that their parent was too harsh on them. Although the intervention did not include any parent feedback. Parents were instructed to read the provided script only. Parents could have discussed correct answers after the session, since they had the original complete worksheets. Although possible, there was no indication that such had occurred.

There were no notable differences in parents' opinions of one condition or the other. This is of interest considering that the segmented condition actually required parents to do five times the amount of providing worksheets, setting timers, and taking pictures after the session. However, there was no difference in treatment integrity for either condition per parent. Treatment integrity ranged from 96%-100% across all four

participants. This finding was congruent with other parent implemented intervention studies (Hoffmann et al., 2019; Unholz-Bowden et al., 2020; Zhou et al., 2018), and suggests that parents can implement academic interventions with high integrity.

Limitations

Although this study provides meaningful findings, it is not without limitations. First and foremost is that with a virtual environment, there are many variables the researcher cannot control. Some examples include, house remodeling, injuries, and siblings and other members of the household contributing to the child's distraction. This study did offer insight into a multitude of reasons homework time can be less than successful. Secondly, with creating all of the worksheets in advance and mailing them color coded before the first intervention point, it was not possible to extend phases out if the data warranted. Thirdly, to avoid ceiling effects, 100 problems per worksheet or set of worksheets was given. Although a script reminding the students, they did not have to finish each problem was read at the beginning of each session, it was quite clear students were overwhelmed by that many problems knowing that their time was limited. Specifically, students were not fond of the segmented worksheets. However, this study controlled for ceiling effects, by providing a time limit of two minutes per segmented worksheet and 10 minutes per whole worksheet. The timing limitations could have been a contributing factor to their dislike of the segmented worksheets.

Additionally, due to the virtual nature of this study during the height of the Pandemic, it is unclear the quality or level of instruction these students had received in the past year. If this same study was conducted in person or in small group settings would there have been different results? In Wallace et al., (2003), there was an effect. However,

there was only one participant, and they were able to better control for environmental variables.

Lastly, the worksheet problems were designed in a horizontal manner which could have contributed to the adverse reaction of students. Additional studies should look at the quality of work completion given both horizontal and vertical problem presentations. Horizontal problems might have required additional scratch paper that the researcher did not provide. By either providing scratch paper or formatting the problems vertically, the response cost could have decreased, resulting in more problems completed and more DCPM.

Future Directions

Future research should focus on implementation in the classroom setting possibly without such a stringent time factor to see if the effect found can be replicated in a classroom full of students. In the Wallace et al., (2003) study, worksheets were not provided a time limit, and although they anecdotally mention that the time required for him to complete his math work decreased, they did not collect duration data. Future studies should consider allowing the student to work without a set time or knowledge of a set time but collecting duration data to see if the duration decreases based on segmented worksheets, while continuing to assess for completed problems and DCPM. This research should focus on second and third-grade and fourth and fifth-grade students primarily because the data from this study shows support for a major mathematical skill difference between these two grade points. Secondarily, future research should consider ways to improve on-task academic behavior in the home setting. Although it is evident that parents can implement interventions with integrity, future homework or parent

implemented academic interventions should focus on creating an effective academic environment within the home. This could include finding ways to understand and account for the different stimulus available in the home environment compared to the classroom or clinic setting.

APPENDIX A -IRB Approval Letter

Office of Research Integrity

THE UNIVERSITY OF SOUTHERN MISSISSIPPI

118 COLLEGE DRIVE #5125 • HATTIESBURG, MS | 601.266.6576 | USM.EDU/ORI

NOTICE OF INSTITUTIONAL REVIEW BOARD ACTION

The project below has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services regulations (45 CFR Part 46), and University Policy to ensure:

- The risks to subjects are minimized and reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered involving risks to subjects must be reported immediately. Problems should be reported to ORI via the Incident template on Cayuse IRB.
- The period of approval is twelve months. An application for renewal must be submitted for projects exceeding twelve months.
- Face-to-Face data collection may not commence without prior approval from the Vice President for Research's Office.

PROTOCOL NUMBER: IRB-20-489
PROJECT TITLE: The Effects of Segmenting Worksheets on Independent Seatwork with Elementary Students using remote technology and parents as the interventionist
SCHOOL/PROGRAM: School of Psychology, Psychology
RESEARCHER(S): Lauren Peak, D Olmi

IRB COMMITTEE ACTION: Approved
CATEGORY: Expedited
6. Collection of data from voice, video, digital, or image recordings made for research purposes.
7. Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

PERIOD OF APPROVAL: November 11, 2020

Donald Sacco Jr.

Donald Sacco, Ph.D.
Institutional Review Board Chairperson

APPENDIX B -Parental Consent Form

ORI | Office of Research Integrity

INSTITUTIONAL REVIEW BOARD

PARENTAL CONSENT FORM

PARENTAL CONSENT PROCEDURES
This document must be completed by the Principal Investigator and signed by the parent or guardian of each potential research participant. • The Project Information and Research Description sections of this form should be completed by the Principal Investigator before submitting this form for IRB approval. • Signed copies of the long form consent should be provided to a parent or guardian of every participant. Last Edited March 5th, 2019

Today's date:		
PROJECT INFORMATION		
Project Title: The Effects of Segmenting Worksheets on Independent Seatwork with Elementary Students using Remote Technology and Parent Interventionists		
Principal Investigator: Lauren Peak M.S. and Joe Olmi Ph.D	Phone: 601-266-5693 601-213-8746	Email: lauren.douglas@usm.edu d.olmi@usm.edu
College: School of Psychology	School and Program: School Psychology Doctoral Program	
RESEARCH DESCRIPTION		

1. **Purpose**:

   This study will seek to determine if segmenting work into smaller task will increase academic production (problems completed) and accuracy (digits correct per minute). This study will determine if this is an effective intervention as a single component and add to a limited literature base.

2. **Description of Study:**

   Two parent meetings each lasting about 20 minutes, one curriculum based measurement assessment which will take about 20 minutes, and ten, 10-12 minute sessions, the whole process should only take 3 Hours but will be split into small segments over the course of a few weeks. This study will have 4 participants in grades 3rd-5th. Since this is a virtual study all sessions will take place in your home via Zoom.

3. **Benefits:**

   The potential benefits of this study include increase academic production and accuracy with math computation.

4. **Risks:**

   The risk involved with this study is limited. The student might not enjoy doing additional mathwork however each session takes up a minimal amount of time.

5. **Confidentiality:**

   Zoom has privacy settings for telehealth already set for each graduate students account. These settings include always having a meeting passcode and only allowing the host to admit someone into the chat. All

worksheets will not have the childs name on them, they will only have intials sense they will be sent virtually the images can also be encrypted.

6. **Alternative Procedures:**

Participation in this study is voluntary. If parents do not wish to participate or have their student participate there will be no consequences and they will still be able to qualify for future studies with USM.

7. **Participant's Assurance:**

This project has been reviewed by the Institutional Review Board, which ensures that research projects involving human subjects follow federal regulations.

Any questions or concerns about rights as a research participant should be directed to the Manager of the IRB at 601-266-5997.Participation in this project is completely voluntary, and participants may withdraw from this study at any time without penalty, prejudice, or loss of benefits.

Any questions about the research should be directed to the Principal Investigator using the contact information provided in Project Information Section above.

PARENTAL CONSENT INFORMATION	
Participant's Name:	Participant's Age:
Parent or Guardian's Name:	
Person Soliciting Parental Consent:	

AGREEMENT TO ALLOW PARTICIPATION IN RESEARCH

Consent is hereby given to participate in this research project. All procedures and/or investigations to be followed and their purpose, including any experimental procedures, were explained. Information was given about all benefits, risks, inconveniences, or discomforts that might be expected.

The opportunity to ask questions regarding the research and procedures was given. Participation in the project is completely voluntary, and participants may withdraw at any time without penalty, prejudice, or loss of benefits. All personal information is strictly confidential, and no names will be disclosed. Any new information that develops during the project will be provided if that information may affect the willingness to continue participation in the project.

Questions concerning the research, at any time during or after the project, should be directed to the Principal Investigator with the contact information provided above. This project and this consent form have been reviewed by the Institutional Review Board, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research participant should be directed to the Chair of the Institutional Review Board, The University of Southern Mississippi, 118 College Drive #5125, Hattiesburg, MS 39406-0001, 601-266-5997.

Parent or Guardian of Research Participant	**Person Explaining the Study**
Date	**Date**

APPENDIX C -Minor Assent

ORI | Office of Research Integrity

INSTITUTIONAL REVIEW BOARD

MINOR ASSENT FORM

MINOR ASSENT PROCEDURES

This document must be completed by the Principal Investigator and signed by each assenting minor.

- The Project Information and Research Description sections of this form should be completed by the Principal Investigator before submitting this form for IRB approval.
- Parental consent must be obtained before soliciting the assent of any minor participating in the study.
- Signed copies of the IRB approved assent form should be provided to a parent or guardian of every assenting minor.

Last Edited March 5th, 2019

Today's date:		
PROJECT INFORMATION		
Project Title: The Effects of Segmenting Worksheets on Independent Seatwork with Elementary Students using Remote Technology and Parent Interventionists		
Principal Investigator: Lauren Peak M.S. and Joe Olmi Ph.D	Phone: 601-266-5693 601-213-8746	Email: lauren.douglas@usm.edu d.olmi@usm.edu
College: School of Psychology	School and Program: School Psychology Doctoral Program	

RESEARCH DESCRIPTION

1. **Why am I being asked to participate?**

   Your participation in this study will help us find better ways to help students complete work.

2. **What will I have to do?**

   To be a part of this study you will only have to do some math work for about 30 mintues one day and then 15 sessions of 10 mintues of math work spread out over a couple of weeks.

3. **What do I get if I agree to participate?**

   Participating in this study will give you the chance to practice your math skills, two binders, twenty pencils and two pencil pouches.

4. **Can anything bad happen if I participate?**

   The worst thing that can happen if you participate is doing a little extra math work, however the study is designed for each session to be quick and not to difficult.

5. **Who will get to see information about me?**

   No aside from the primary researcher and on this form no one will know your real name. A made up name will be attached to any data that will be shared with data from other participants to other Academic and Professional Adults.

6. **What if I do not want to participate?**

If you do not want to participate that is your right and there will be no consquences however, your help would be greatly appreciated to find better ways to help students get their work done.

7. **Who may I contact if I have other questions or concerns about my participation?**

This project has been approved by the Institutional Review Board. Its job is to protect research participants. Questions or concerns about your participation should be directed to the Manager of the IRB at 601-266-5997.

ASSENT TO PARTICIPATE IN RESEARCH

Participant's Name:	Participant's Age:
Person Soliciting Assent:	

Check one of the following (to be completed by the person soliciting assent):

☐ In my opinion this minor is able to provide informed assent (proceed to Agreement to Participate).
☐ In my opinion this minor is unable to provide informed assent for the following reason(s) (do not proceed):

AGREEMENT TO PARTICIPATE

I agree to participate in this research project. The project has been fully explained to me and I was given the chance to ask any questions I have about it. I understand that I can stop participating at any time.

_____	_____
Research Participant	**Person Soliciting Assent**
_____	_____
Date	**Date**

APPENDIX D - Parent Meeting Outline

- The parent is given an explanation of how the study will work.
    - Including how observation will be conducted and ways to reduce reactivity.
    - The researcher will train the parent on the best placement of the device during observations.
    - And at the 10-minute mark, the student's work will need to be captured for data collection purposes but then can be returned to the student.
- Inclusion and exclusion criteria are discussed.
    - Specifically, the compliance questions.
- The parent is given the opportunity to ask questions.
- The parent consent form is administered and signed.
- Scheduling of the CBM session.
- Obtain the address to send materials.

APPENDIX E - Observational Data Collection Form

Participant: _____Date: _____Time: _____ Phase: _____

Primary Observer: _____ Secondary Observer:

_____

1.1		**1.2**		**1.3**		**1.4**		**1.5**		**1.6**	
ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
2.1		**2.2**		**2.3**		**2.4**		**2.5**		**2.6**	
ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
3.1		**3.2**		**3.3**		**3.4**		**3.5**		**3.6**	
ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
4.1		**4.2**		**4.3**		**4.4**		**4.5**		**4.6**	
ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
5.1		**5.2**		**5.3**		**5.4**		**5.5**		**5.6**	
ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
6.1		**6.2**		**6.3**		**6.4**		**6.5**		**6.6**	
ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
7.1		**7.2**		**7.3**		**7.4**		**7.5**		**7.6**	
ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
8.1		**8.2**		**8.3**		**8.4**		**8.5**		**8.6**	
ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
9.1		**9.2**		**9.3**		**9.4**		**9.5**		**9.6**	
ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
10.1		**10.2**		**10.3**		**10.4**		**10.5**		**10.6**	
ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF

On-task: _____/60= _____ Off-task: _____/60=_____

APPENDIX F - Steps for Phase A

- The parent will logon to the zoom session at the agreed upon time.
- The Parent will set up the device and dim the screen.
- Script for Intervention B:

  Parent- It's time to do your math. Today we are going to do smaller assignments for two minutes each. Here is your paper get started.

- Parent then sets a two-minute timer.
- When the timer goes off the parent takes segmented worksheet one and hands the student number two.
- Parent sets a two-minute timer.
- When the timer goes off the parent takes segmented worksheet two and hands the student number three.
- Parent sets a two-minute timer.
- When the timer goes off the parent takes segmented worksheet three and hands the student number four.
- Parent sets a two-minute timer.
- When the timer goes off the parent takes segmented worksheet four and hands the student number five.
- Parent sets a two-minute timer.
- When the timer goes off the parent takes segmented worksheet five.
- The parent then sends the pictures of the worksheets to the researcher.
- After the researcher has confirmed she received the pictures, the session will end.

APPENDIX G - Treatment Integrity Form for Intervention Phase A

The parent read the segmented script.	
The parent gave the child segmented worksheet one.	
The parent started a timer for 2 minutes within 5 seconds.	
When the timer sounded, the parent gave the student the 2nd segmented worksheet.	
The parent started a timer for 2 minutes within 5 seconds.	
When the timer sounded the parent gave the student the 3rd segmented worksheet.	
The parent started a timer for 2 minutes within 5 seconds.	
When the timer sounded, the parent gave the student the 4th segmented worksheet.	
The parent started a timer for 2 minutes within 5 seconds.	
When the timer sounded, the parent gave the student the 5th segmented worksheet.	
The parent started a timer for 2 minutes within 5 seconds.	
When the timer sounded for the 5th time, the parent took the student's 5th segmented worksheet.	
At the end of the session the parent took all five of the student's segmented worksheets, took a picture, and sent it to the observer.	
Percent Completed:	

Number of Problems Completed: _____ Number of Digits correct per minute: _____

APPENDIX H -Steps for Phase B

- The parent will logon to the zoom session at the agreed upon time.
- The Parent will set up the device and dim the screen.
- Script for Phase B

  Parent- It's time to do your math. Today we are doing one assignment for 10 minutes. Here is your paper get started.

- Parent then sets a ten-minute timer.
- When the timer goes off the parent takes the whole worksheet one.
- The parent then sends the pictures of the worksheets to the researcher.
- After the researcher has confirmed she received the pictures, the session will end.

APPENDIX I -Treatment Integrity Form for Intervention Phase B

The parent set the device in an unobtrusive location and dimmed the screen.	
The parent read the Whole Worksheet script.	
The parent gave the child the whole worksheet.	
The parent started a time for 10 minutes within 5 seconds of giving the worksheet.	
At the 10-minute mark, the parent took all of the student's worksheet and took a picture and sent it to the observer.	
Total	

Number of Problems Completed: _____

Number of Digit correct per minute: _____

APPENDIX J - Intervention Rating Profile

Intervention Rating Profile

The purpose of this questionnaire is to obtain information that will aid in the selection of interventions. Children with academic production problems will use these interventions. Please mark the box which best describes your agreement or disagreement with each statement

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1. This would be an acceptable intervention for the child's academic production.						
2. Most teachers would find this intervention appropriate for academic production problems in addition to the one described.						
3. This intervention should prove effective in changing in the child's academic production.						
4. I would suggest the use of this intervention to teachers.						
5. The child's academic production is severe enough to warrant use of this intervention.						
6. Most teachers would find this intervention suitable for the academic production.						
7. I would be willing to use this intervention in the classroom setting.						
8. This intervention would not result in negative side effects for the student.						
9. This intervention would be appropriate for a variety of children.						
10. This intervention is consistent with those I have used.						
11. The intervention was a fair way to handle the child's academic production.						
12. This intervention is reasonable for the academic production behavior described.						
13. I like the procedures used in this intervention.						
14. This intervention was a good way to handle this child's academic production.						
15. Overall, this intervention would be beneficial for the child.						

Adapted from: Witt, J. C. and Elliott, S. N. (1985). Acceptability of classroom intervention strategies. In T. R. Kratochwill (Ed.), Advances in School Psychology, 4, 251-288. Mahwah, NJ: Erlbaum.

APPENDIX K - Child Intervention Rating Profile

POST-INTERVENTION

Student:

Date:

Adapted Version of the Children's Intervention Rating Profile

	I agree  ***1***	***2***	***3***	***4***	***5***	***I do not agree***  ***6***
1. The program we used was fair.						
2. I think my teacher was too harsh on me.						
3. Being in this program caused problems with my friends.						
4. There were better ways to teach me.						
5. This program could help other kids, too.						
6. I liked the program we used.						
7. Being in this program helped me do better in school.						
8.						

Comments: _____

_____

_____

Please see Excel file, "Social Validity Adapted CIRP Scoring Tool" and Word document, "Social Validity Adapted CIRP Scoring Guide" for scoring instructions.

Source: Adapted from Witt, J.C. & Elliott, S.N. (1985). Acceptability of classroom intervention strategies. In Kratochwill, T.R. (Ed.), *Advances in School Psychology, Vol. 4*, 251 – 288. Mahwah, NJ: Erlbaum.

APPENDIX L - Segmented Worksheet 2nd grade

12 + 1 =	4 + 1 =	86+10=
6 + 13 =	17 - 2 =	82+10=
2 + 1 =	7 - 6 =	20+30+60=
10 + 18 =	16 - 5 =	11+13=
18 + 13 =	1+8+2=	339+340=
17 + 10 =	9+1+8+3=	686 – 30 =
0 + 3 =	0+4+3+5=	**Participant 4 Form A 2.1**

11 + 7 =	81+17=	60+20+40=
13 + 6 =	8+3-7+8=	50+90+60=
10 + 3 =	8+8+3+1=	44 +98=
16 + 13 =	4+9-9=	29+10=
15 + 5 =	0+5+4=	509+30=
7 - 7 =	2+5+1=	25+703=
12 - 1 =	19 - 7 =	**Participant 4 Form A 2.2**

11 + 5 =	16 - 15 =	44+2=
7 + 2 =	12 - 7 =	81 + 1 =
9 + 10 =	20 - 20 =	10+30+70=
9 + 6 =	1+1+5+7=	31+21=
7 + 17 =	6+5+2+9=	52+910=
16 + 14 =	3+2+6=	657 – 10 =
9 + 13 =	19 + 8 =	**Participant 4 Form A 2.3**

19 + 3 =	15 - 1 =	45+44=
3 + 1 =	8+8+5+6=	20+20+40=
9 + 20 =	7+3+9+1=	97+56=
2 + 3 =	1+3+3-3=	307+131=
19 + 17 =	7+8-3+8=	161 – 140 =
15 - 7 =	9+3-7=	588 – 20 =
14 - 6 =	9+8+6=	**Participant 4 Form A 2.4**

5 + 8 =	28+10=	70+80+50=
20 + 1 =	7+3-6+2=	60+40+90=
20 + 19 =	1+4+7+2=	6+70=
16 + 1 =	8+5-8=5	26+40=
12 + 0 =	1+2+9=12	323+265=
10 - 8 =	0+3+2=	536+220=
19 - 19 =	8 - 8 =	**Participant 4 Form A 2.5**

APPENDIX M -Whole Worksheet 2nd grade

Participant 4 Form B 2.1

- 8 + 3 =
- 8 + 7 =
- 15 + 10 =
- 9 + 17 =
- 19 + 15 =
- 10 + 1 =
- 18 + 4 =
- 10 + 6 =
- 17 + 12 =
- 8 + 9 =
- 5 + 10 =
- 0 + 13 =
- 4 + 11 =
- 19 + 6 =
- 9 + 14 =
- 16 + 17 =
- 6 + 5 =
- 8 + 14 =
- 17 + 20 =
- 5 + 14 =
- 12 + 16 =
- 17 + 8 =
- 4 + 8 =
- 1 + 2 =
- 7 + 0 =
- 11 + 1 =
- 3 + 0 =
- 2 + 2 =
- 9 + 9 =
- 14 - 4 =
- 15 - 11 =
- 2 - 0 =
- 17 - 4 =
- 16 - 2 =
- 20 - 7 =
- 20 - 13 =
- 16 - 3 =
- 12 - 3 =
- 19 - 4 =
- 10 - 0 =
- 10 - 6 =
- 5 - 4 =
- 20 - 16 =
- 10 - 4 =
- 3+8+7=
- 3+7+4=
- 2+6+0=
- 9+8+8=
- 0+4+7=
- 8+1+4=
- 1+3+0=
- 6+1-8=
- 8+9-8=
- 7+2-2=
- 9+2+8+3=
- 6+4+4+2=
- 3+8+6+8=
- 1+8+9+4=
- 6+1+5+2=
- 6+7+2+5=
- 3+6+0+5=
- 1+0+6+7=
- 6+9-5+4=
- 1+8-4+1=
- 7+6+1-5=
- 6+3-2+1=
- 71+1=
- 72+12=
- 39+20=

- 44+31=
- 12+23=
- 6 + 70 =
- 68+10=
- 20+40+30=
- 70+70+90=
- 80+70+80=
- 80+20+80=
- 70+40+40=
- 90+80+40=
- 10+40+20=
- 75+10=
- 31 + 18=
- 74 +67=
- 1+53=
- 50+36=
- 76+10=
- 25+30=
- 80+19=
- 7+50=
- 52 +78=
- 49+810=
- 566+431=
- 371+416=
- 362+623=
- 236+42=
- 853+130=
- 861+133=
- 682 – 40 =
- 864 – 130 =
- 857 – 10 =

APPENDIX N - Segmented Worksheet 3rd grade

18 + 15 =	3 - 2 =	4.1 + 6.2 =
7 + 16 =	20 - 19 =	6.0- 4.6=
4 + 1 =	7 x 2 =	58+5=
1 + 16 =	501+5=	752+6=
7 + 20 =	592+2=	60×60=
19 + 0 =	425-20=	41 x 8 =
9 - 0 =	75-60=	**Participant 3 Form A 2.1**

1 + 11 =	1 - 1 =	9.0-3.8=
10 + 17 =	18 - 4 =	9.0-2.9=
15 + 17 =	4 x 4 =	49+5=
16 + 16 =	6 ÷ 1 =	956+8=
12 + 18 =	225-70=	499+8=
15 + 19 =	9.3+2.9=	70×40=
11 - 8 =	5.1+ 1.0=	**Participant 3 Form A 2.2**

20 + 5 =	20 - 15 =	2.0+9.2=
20 + 17 =	17 - 17 =	4.0- 1.7=
9 + 4 =	0 x 5 =	34+8=
6 + 13 =	752+5=	348+5=
15 + 0 =	385+9=	60×90=
16 + 6 =	430-40=	47 x 1 =
16 - 11 =	474-40=	**Participant 3 Form A 2.3**

1 + 3 =	19 - 14 =	8.0-4.5=
4 + 10 =	19 - 13 =	69+7=
17 + 0 =	1 x 9 =	490+5=
14 + 8 =	858+9=	60×70=
0 + 16 =	371+6=	48 x 3 =
2 + 4 =	925-30=	61 x 5 =
18 - 10 =	1.9+ 5.1=	**Participant 3 Form A 2.4**

7 + 5 =	17 - 7 =	8.0-5.6=
4 + 20 =	2 x 0 =	54+7=
6 + 1 =	3 x 1 =	43+7=
0 + 15 =	924-50=	953+1=
18 + 7 =	7.1+5.0=	501+5=
19 - 6 =	5.4+ 2.2=	50×30=
20 - 0 =	4.0- 3.2=	**Participant 3 Form A 2.5**

APPENDIX O - Whole Worksheet 3rd grade

Participant 3 Form B 2.1

- 6 + 17 =
- 19 + 16 =
- 17 + 20 =
- 4 + 16 =
- 1 + 15 =
- 7 + 8 =
- 9 + 2 =
- 6 + 14 =
- 12 + 13 =
- 16 + 18 =
- 6 + 9 =
- 18 + 11 =
- 18 + 8 =
- 20 + 19 =
- 9 + 3 =
- 11 + 7 =
- 7 + 4 =
- 4 + 15 =
- 7 + 1 =
- 5 + 7 =
- 7 + 11 =
- 6 + 0 =
- 4 + 6 =
- 11 + 13 =
- 10 + 9 =
- 15 + 3 =
- 0 + 7 =
- 13 + 19 =
- 7 + 3 =
- 16 - 9 =
- 10 - 1 =
- 13 - 4 =
- 18 - 2 =
- 12 - 1 =
- 5 - 0 =
- 20 - 3 =
- 16 - 2 =
- 15 - 5 =
- 2 - 2 =
- 16 - 5 =
- 19 - 16 =
- 13 - 8 =
- 5 - 3 =
- 13 - 10 =
- 2 x 1 =
- 0 x 2 =
- 6 x 4 =
- 6 x 8 =
- 1 x 3 =
- 3 x 5 =
- 9 ÷ 9 =
- 238+6=
- 597+5=
- 403+4=
- 418+6=
- 154+2=
- 801+6=
- 480-40=
- 910-20=
- 941-20=
- 465-90=
- 592-30=
- 380-10=
- 406-70=
- 2.7+ 5.7=
- 5.1 + 9.2 =
- 2.2+5.1=
- 8.5 + 9.5 =
- 2.5+ 0.8=

- 8.1 + 3.6 =
- 5.6 + 5.3 =
- 7.0- 3.8=
- 7.0-2.0=
- 6.0-5.5=
- 9.0- 7.4=
- 9.0-2.8=
- 5.0- 3.9=
- 8.0-2.1=
- 25+7=
- 49+4=
- 77+4=
- 36+6=
- 61+9=
- 65+7=
- 734+4=
- 219+2=
- 941+1=
- 216+5=
- 403+4=
- 255+8=
- 968+6=
- 30×60=
- 30×70=
- 50 × 40 =
- 90×40=
- 80×90=
- 84 x 4=
- 77 x 2 =
- 99x 5=
- 94 x 3 =

APPENDIX P - Segmented Worksheet 4th grade

10 x 9=	500÷5=	0.53 - 0.44 =
3 x 1 =	62÷8=	0.83 - 0.71 =
32 ÷ 8 =	$\frac{3}{4}+\frac{2}{4}=$	6.0- 0.4=
5×90=	$\frac{7}{8}-\frac{6}{8}=$	1.9+ 0.9=
7×37=	2.4+ 6.2=	0.80 + 0.06 =
78 × 87=	0.9+8.6=	0.70 + 0.06 =
790÷5=	7.8+6.3=	**Participant 2 Form A 2.1**

6x10=	273÷3=	4.3-0.7=
5 x 5 =	480÷6=	5.7-4.2=
66 ÷ 6 =	99÷6=	1.8 + 0.13 =
40 ÷ 4 =	$\frac{24}{25}+\frac{11}{25}=$	0.30 + 0.18 =
3×35=	$\frac{2}{4}-\frac{1}{4}=$	0.90 + 0.02 =
2×36=	4.3+ 4.1=	6.5+0.6=
2×890=	1.1+ 0.5=	**Participant 2 Form A 2.2**

7 x 2 =	3 ÷ 8 =	9.5- 9.2=
6 x 12=	36÷8=	1.2-0.5=
81 ÷ 9 =	$\frac{8}{12}+\frac{7}{12}=$	8.9- 0.6=
72 ÷ 9 =	$\frac{6}{13}+\frac{7}{13}=$	1.9+ 0.06=
5×13=	397 x 17	1.7+ 0.19=
8×821=	9473 x 97	0.60 + 0.11 =
7×450=	605÷5=	**Participant 2 Form A 2.3**

8 x 3 =	9×362=	5.6-3.6=
1 x 5 =	97 × 59=	9.2- 8.8=
80 ÷ 10 =	345÷3=	1.7 + 0.02 =
8 ÷ 8 =	2÷8=	0.10 + 0.09 =
3×61=	$\frac{10}{16}+\frac{12}{16}=$	0.30 + 0.13 =
4×28=	831 x 34=	9.1+8.2=
4×786=	7725 x38 =	**Participant 2 Form A 2.4**

8 x 9 =	3 ÷ 5 =	0.63- 0.44=
88 ÷ 8 =	58÷9=	8.4- 0.79=
49 ÷ 7 =	$\frac{9}{15}+\frac{14}{15}=$	6.8- 3.2=
8×24=	$\frac{20}{50}+\frac{11}{50}=$	0.15 + 0.19 =
2×460=	456 x 25	1.5 + 0.13 =
5×199=	8233 x 48	5.9 + 1.8 =
42 × 45=	63÷9=	**Participant 2 Form A 2.5**

APPENDIX Q - Whole Worksheet 4th grade

Participant 2 Form B 3.1

- 2 x 8 =
- 9 x 5 =
- 11 x 7 =
- 6 x 6 =
- 12 x 9 =
- 8 x 8 =
- 7 x 9 =
- 8 x 6 =
- 2 x 11 =
- 24 ÷ 6 =
- 21 ÷ 7 =
- 22 ÷ 2 =
- 32 ÷ 4 =
- 24 ÷ 4 =
- 12 ÷ 4 =
- 48 ÷ 12 =
- 27 ÷ 9 =
- 8 ÷ 2 =
- 4×21=
- 4×85=
- 2×75=
- 4×80=
- 7×62=
- 6×43=
- 3×76=
- 2×79=
- 4×858=
- 3×163=
- 5×654=
- 3×337=
- 7×738=
- 9×367=
- 4×650=
- 8×630=
- 36 × 15=
- 18 × 18=
- 70 × 39=
- 612÷6=
- 525÷7=
- 435÷3=
- 492÷3=
- 824÷8=
- 18÷6=
- 981÷9=
- 56÷6=
- 46÷6=
- 28÷9=
- 31÷7=
- 51 ÷ 7 =
- 17÷9=
- $\frac{10}{15}+\frac{7}{15}=$
- $\frac{4}{6}+\frac{5}{6}=$
- $\frac{8}{100}+\frac{56}{100}=$
- $\frac{2}{7}+\frac{6}{7}=$
- $\frac{2}{5}+\frac{4}{5}=$
- $\frac{72}{100}+\frac{11}{100}=$
- $\frac{1}{8}+\frac{5}{8}=$
- $\frac{9}{12}-\frac{8}{12}=$
- $\frac{7}{12}-\frac{6}{12}=$
- 945 x22
- 948 x 38
- 424 x 85
- 6132 x 52
- 7151 x 89
- 9131 x 62
- 8.5+ 4.2=

- 8.4+6.8=
- 5.0 + 8.9 =
- 4.8+ 5.6=
- 0.2+ 0.9=
- 9.7+ 0.9=
- 8.0+ 8.9=
- 7.4+ 3.5=
- 0.50 + 0.00 =
- 0.20 + 0.03 =
- 0.40 + 0.07 =
- 0.20 + 0.03 =
- 0.90 + 0.18 =
- 0.30 + 0.15 =
- 0.50 + 0.20 =
- 1.2+ 0.0=
- 0.14+ 0.02=
- 1.9+ 1.4=
- 0.10+ 0.18=
- 0.17 + 0.09 =
- 1.8 + 0.18 =
- 0.13+ 0.18=
- 1.4 + 0.03 =
- 0.19 + 1.6 =
- 6.6-0.3=
- 3.8-0.8=
- 7.9-0.8=
- 2.3-2.0=
- 8.4-6.7=
- 6.3- 0.3=
- 1.8-0.4=
- 7.4- 1.5=
- 0.70- 0.23=
- 0.76 - 0.23 =
- 9.4-4.4=
- 0.94 - 0.24 =
- 8.7- 0.84=

APPENDIX R - Segmented Worksheet 5th grade

22 ÷ 2 =	866÷6=	$2\frac{53}{100} - 1\frac{75}{100} =$
9 ÷ 1 =	981÷8=	$5\frac{1}{12} + 1\frac{1}{12} =$
3 x 3=	$\frac{27}{54} =$	0.6- 0.3=
6×86=	$\frac{99}{100} + \frac{69}{100} =$	0.12×10=
6×52=	$\frac{2}{7} - \frac{1}{7} =$	0.4÷2=
6×518=	$\frac{6}{12} + \frac{2}{9} =$	4.8÷8=
73÷7=	$\frac{7}{11} - \frac{1}{2} =$	**Participant 1 Form A 3.1**

32 ÷ 8 =	25÷5=	$\frac{8}{9} - \frac{5}{6} =$
54 ÷ 9 =	578÷6=	$9\frac{1}{20} - 2\frac{16}{20} =$
7 x 10 =	622÷8=	$7\frac{2}{5} + 6\frac{3}{5} =$
4 x 11 =	$Reduce: \frac{8}{12} =$	5.5 + 3.1 =
6×62=	$\frac{1}{2} + \frac{1}{2} =$	0.78- 0.55=
9×77=	$\frac{10}{11} - \frac{9}{11} =$	6.1×100=
8×878=	$\frac{4}{11} + \frac{10}{11} =$	**Participant 1 Form A 3.2**

35 ÷ 7 =	4×817=	$\frac{1}{5}+\frac{6}{8}=$
48 ÷ 6 =	82÷8=	$\frac{10}{11}-\frac{7}{8}=$
2 x 1 =	79÷3=	$3\frac{2}{9}-1\frac{6}{9}=$
11 x 2 =	945÷5=	$8\frac{10}{11}+5\frac{4}{11}=$
3×62=	$Reduce: \frac{35}{40}=$	1.6+7.8=
2×71=	$\frac{8}{11}+\frac{5}{11}=$	6.7- 3.7=
5×694=	$\frac{30}{50}-\frac{22}{50}=$	**Participant 1 Form A 3.3**

63 ÷ 9 =	51÷8=	$\frac{9}{10}-\frac{1}{5}=$
100 ÷ 10 =	54÷4=	$7\frac{6}{15}-2\frac{7}{15}=$
5 x 7 =	897÷5=	$5\frac{1}{12}-1\frac{7}{12}=$
6 x 3 =	$Reduce: \frac{6}{8}=$	$10\frac{13}{16}+2\frac{4}{16}=$
4×81=	$\frac{3}{4}+24=$	7.1 + 7.3 =
2×321=	$\frac{10}{11}-\frac{8}{11}=$	0.77- 0.58=
5×281=	$\frac{2}{4}+\frac{6}{7}=$	**Participant 1 Form A 3.4**

28 ÷ 4 =	91÷7=	$5\frac{3}{7}+5\frac{6}{7}=$
6 x 10 =	224 ÷ 4 =	4.0+ 3.3=
4 x 4 =	$Reduce: \frac{9}{12}=$	11.1×10=
4×72=	$Reduce: \frac{48}{96}=$	9.05×10=
6×231=	$\frac{13}{14}+\frac{7}{14}=$	8.4÷3=
4×836=	$\frac{10}{11}-\frac{2}{11}=$	4.8÷2=
83÷4=	$\frac{1}{2}+\frac{8}{11}=$	**Participant 1 Form A 3.5**

APPENDIX S - Whole Worksheet 5th grade

Participant 1 Form B 2.1

- $110 \div 10 =$
- $72 \div 6 =$
- $7 \div 7 =$
- $66 \div 6 =$
- $9 \div 9 =$
- $120 \div 12 =$
- $11 \div 11 =$
- $36 \div 12 =$
- $42 \div 6 =$
- $10 \times 11 =$
- $5 \times 8 =$
- $7 \times 6 =$
- $7 \times 1 =$
- $10 \times 6 =$
- $7 \times 2 =$
- $12 \times 1 =$
- $2 \times 6 =$
- $11 \times 6 =$
- $3 \times 91 =$
- $6 \times 53 =$
- $5 \times 69 =$
- $5 \times 19 =$
- $5 \times 98 =$
- $2 \times 94 =$
- $3 \times 47 =$
- $2 \times 746 =$
- $5 \times 789 =$
- $8 \times 235 =$
- $3 \times 569 =$
- $7 \times 173 =$
- $4 \times 285 =$
- $3 \times 772 =$
- $4 \times 662 =$
- $82 \div 6 =$
- $12 \div 7 =$
- $40 \div 3 =$
- $87 \div 4 =$
- $8 \div 4 =$
- $64 \div 8 =$
- $17 \div 7 =$
- $61 \div 8 =$
- $250 \div 6 =$
- $972 \div 4 =$
- $361 \div 2 =$
- $691 \div 2 =$
- $926 \div 8 =$
- $367 \div 2 =$
- $471 \div 5 =$
- $81 \div 9 =$
- $Reduce: \frac{16}{32} =$
- $Reduce: \frac{15}{30} =$
- $Reduce: \frac{12}{20} =$
- $Reduce: \frac{8}{80} =$
- $Reduce: \frac{9}{12} =$
- $Reduce: \frac{5}{13} =$
- $\frac{7}{15} + \frac{9}{15} =$
- $\frac{2}{6} + \frac{1}{6} =$
- $\frac{2}{50} + \frac{43}{50} =$
- $\frac{4}{7} + \frac{3}{7} =$
- $\frac{1}{10} + \frac{8}{10} =$
- $\frac{10}{11} - \frac{7}{11} =$
- $\frac{3}{4} - \frac{1}{4} =$
- $\frac{31}{40} - \frac{18}{40} =$
- $\frac{5}{6} - \frac{4}{6} =$
- $\frac{53}{100} - \frac{37}{100} =$

- $\frac{1}{2}+\frac{1}{4}=$
- $\frac{1}{6}+\frac{8}{12}=$
- $\frac{5}{7}+\frac{3}{6}=$
- $\frac{1}{10}+\frac{5}{6}=$
- $\frac{7}{9}+\frac{1}{2}=$
- $\frac{2}{4}-\frac{2}{6}=$
- $\frac{2}{8}-\frac{1}{6}=$
- $\frac{1}{3}-\frac{2}{8}=$
- $\frac{3}{5}-\frac{1}{3}=$
- $9\frac{5}{9}-2\frac{7}{9}=$
- $9\frac{2}{16}-1\frac{7}{16}=$
- $3\frac{4}{8}-\ 2\frac{6}{8}=$
- $9\frac{1}{4}-1\frac{3}{4}=$
- $8\frac{4}{6}-2\frac{5}{6}=$
- $6\frac{6}{14}+4\frac{7}{14}=$
- $7\frac{2}{7}+\ 5\frac{3}{7}=$
- $9\frac{27}{50}+3\frac{22}{50}=$
- $8\frac{5}{6}+6\frac{5}{6}=$
- $4\frac{2}{16}+\ 6\frac{13}{16}=$

- 8.5 + 4.2 =
- 6.8+5.3=
- 2.0+7.9=
- 8.1+3.3=
- 0.93- 0.3=
- 0.92 - 0.45 =
- 0.88 - 0.86 =
- 0.83 - 0.33 =
- 61.7×100=
- 3.78×100=
- 5.35×10=
- 8.75 × 10 =
- 1.6÷8=
- 1.2÷2=
- 9.6÷8=
- 3.6÷6=

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